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SUBJECT: SOUTH AFRICA: SERIOUS POWER DISRUPTIONS IN THE WESTERN CAPE

REF: A) CAPETOWN 73, B)CAPETOWN 77, C) PRETORIA 618

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¶1. SUMMARY: (U) Recent power outages in the Western Cape have resulted in major financial losses in the retail and tourism industries, with the Cape Chamber of Commerce predicting losses in the millions. Further outages and/or rolling blackouts are likely until Unit 1 of the Koeberg nuclear power station is brought back on line - potentially in May 2006. Until then, state-owned electric utility Eskom will scramble to provide sufficient power to keep Cape homes and businesses functioning. Eskom and the Department of Public Enterprises are accelerating plans to build new power plants and recommission previously mothballed power stations to prevent further damage to business and South Africa's investment prospects. Minister for Minerals and Energy Lindiwe Hendriks said on March 9 that logistical problems would not affect electricity provided to South Africa's neighbors.

¶2. (U) On the political side, just one day before the March 1 elections, Minister of Public Enterprises Alec Erwin said that the police and National Intelligence Agency (NIA) were investigating the damage at Koeberg, since the "the bolt that caused the generator's destruction did not get there by accident." Erwin added the NIA was ready to bring criminal charges against individuals and that they were also looking at other power outages which could have been caused by sabotage. Opposition politicians from the Democratic Alliance (DA) said that Erwin's allegation amounted to an abuse of political power. After substantial media and political furor, Erwin said on March 3 (two days after the ruling African National Congress (ANC) finished behind the Democratic Alliance (DA) in Cape Town elections) that references to sabotage had been media spin, and that he had not used the term sabotage. END SUMMARY

What Happened

¶3. (U) Since mid-November 2005, starting with the time when Koeberg's Unit 1 was first taken down for scheduled refueling, maintenance and modifications - leaving only Unit 2 in operation, the entire Western Cape province has been plagued by regular power outages. According to Eskom spokesman, Fanie Zulu, these were initially of short duration and due to generation, transmission and distribution network breakdowns and overloads. The immediate causes were identified as natural and technical events that coalesced to produce the blackouts. These events included excess power through the lines, flashovers caused by mist and ash-dust coatings on insulators and sub-stations caused by the spate of bush fires in vulnerable areas.

14. (U) Since mid-December, the Western Cape has been dependent on the 900 MW of electricity supplied by Unit 2 and some 2,200 MW transferred from coal-fired power stations in Mpumulanga. On January 19, Eskom's CEO Thulani Gcabashe announced that on Christmas Day, while in the process of being returned to service, Unit 1 generator set was damaged by a large loose bolt that had somehow gotten into the set. Together with unrelated network faults, these set in motion a series of rolling blackouts throughout the province.

15. (U) Gcabashe stated that Unit 1 was likely to remain down for between three and nine months while Eskom made repairs or found a replacement generator. A spokesman for Koeberg said that security on maintenance, supervision and materials accounting had been strictly applied and that an investigation into how the bolt got into the generator was in progress. Sabotage and malicious intent were not ruled out.

16. (U) Since February, Unit 2 has twice responded to system disturbances and insufficient power from Mpumulanga by removing itself from the system in controlled (programmed) shutdowns. These caused havoc to Cape Town's (and the region's) electricity supply. The Cape Chamber of Business estimated that damage to the economy was in excess of \$100 million, and that Eskom's reputation as a reliable energy provider was severely dented. Eskom board chairman Valli Moosa said it would take some time to get Unit 2 back to full capacity and that Eskom could currently only supply about 2,200 MW.

Electricity in the Western Cape

17. (U) The heart of the problem is that Cape Town lies some 1,500 km from the major electricity supply center in Mpumulanga Province and that its demand for power exceeds available local supply. The Western Cape has no natural energy resources and before 1984, when the Koeberg nuclear plant went on line, most of its electricity (and coal) was imported from Mpumulanga. The long transmission line and rail route made electricity expensive and the distance at times created line instability resulting in

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power outages in Cape Town. The Koeberg nuclear power plant was built to remedy most of these short-comings. It came online in 1984 and is South Africa's only nuclear station. The plant consists of two French-designed 920 MW reactors that have operated safely and efficiently for more than 20 years.

18. (U) The Western Cape's daily demand for electricity averages about 3,700 MW, and peaks at around 5,100 MW in summer to 5,650 MW in winter. Supply is dependent on Koeberg's two reactor units which together supply a base load of 1,800 MW. This is supplemented by the transfer of 2,000 to 3,000 MW (depending on the season and time of day) of power from plants in Mpumulanga. Transmission takes place over a 1,500 km, 400 kV line with a capacity of 3,500 MW - a secure load of about 2,900 MW. Peaking or emergency power of some 1,500 MW is also available from two oil-fired gas turbine and two pump storage stations and two hydro plants.

19. (U) With the full 1,800 MW from Koeberg the Western Cape needs to import a maximum of about 2,100 MW in summer and 2,500 in winter, both comfortably within the transmission line capacity. However, with one unit down imports become 3,000 and 3,400 MW, respectively, which stretches the technical limits of transmission. With both units out, the required imports for winter and summer (3,900 and 4,300 MW) exceed line capacity.

Areas of Concern

110. (U) The problem with reactor 1 being out of order is compounded by the fact that reactor 2 is running low on fuel and needs to be shut down for about 60 days for refueling and maintenance. Eskom said that it will stretch Unit 2's reactor fuel cycle by running it at below capacity, hoping repairs to Unit 1 generator would be completed before reactor 2 runs out of fuel. Nevertheless, Eskom estimates that the shortfall in

supply to the Cape during the coming winter could be about 300 MW, which will have to be catered for by scheduled supply side (load-shedding) and demand side (efficiency) management.

Fallout

¶11. (U) In the late February run up to the provincial elections, opposition political parties used the power problems in the Western Cape (the only hotly contested province) to attack the ANC-lead government. Caught with little defense, Minister Erwin said that the National Intelligence Agency was investigating the damage at Koeberg and was expected to bring criminal charges shortly. Erwin was widely quoted as saying that "the bolt that caused the generator's destruction did not get there by accident." Minister for Minerals and Energy Lindiwe Hendricks made similar innuendos, saying that "the events (i.e. the power outages) curiously coincide with an important process in the democratic calendar of the country" and that "other forces are at play here."

¶12. (U) DA leader Tony Leon characterized the comments - made by Erwin at a press conference in Cape Town on February 28 - as another example of the government's abuse of power, and ascribed the Koeberg damage to "negligence." By March 3, Erwin denied reports that he said the reactor was sabotaged. He said there was no evidence of a significant organized sabotage campaign, but that it was not an accident but an act of human instrumentality - "no one just dropped the bolt". The accusations and counter-accusations continue in the media and parliament.

¶13. (U) Concerns also revolve around the impact that the power failures are having on the local economy and on investor confidence in Eskom's long-nurtured image as a low-cost, reliable supplier of quality electricity to South Africa's resource and manufacturing industries. Questions concern Eskom's ability to deliver sufficient power for the country's economic expansion plans that include 6% GDP growth by 2010, and the soon-to-be-legislated Beneficiation Bill that aims to add value to the 70% of raw materials currently exported. Both are heavily energy-dependent. Mooted expansions in the resource industry include: BHP-Billiton's Mozal and Hillside aluminum plants in Maputo, Mozambique and KwaZulu-Natal, respectively; Alcan's potential new aluminum plant in the Eastern Cape; and major expansions in the platinum mining and ferro-alloy industries. Failure by Eskom to ensure reliable and sufficient quantities of energy could severely impact these and other high-energy project plans.

¶14. (U) A number of countries in the region import electricity from SA. The potential squeeze on Eskom's generation capacity over the next few years, which was highlighted by the on-going blackouts in the Western Cape, has mobilized these countries into examining their energy vulnerabilities should SA reduce or

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stop electricity exports.

¶15. (U) Speaking at a regional hydropower conference, Minister for Minerals and Energy Lindiwe Hendriks said on March 9 that South Africa was not running out of power and that its internal problems should not affect supply to its neighbors. Hendricks said that South Africa would not decide to cut down on its power supply agreements with Eskom's customers because of internal issues.

Remedial Actions

¶16. (U) Eskom executives and the Ministers of Public Enterprises and of Minerals and Energy have stated categorically that Eskom can and will be in the position to generate and deliver the power needs of the South African industry, given the huge amounts of capital that was budgeted for energy generation and infrastructure expansion over the next five to twenty years, amounting to some \$20 billion. Eskom claims that the Western Cape problems are unique, due to its location, lack of own

energy resources, and the rapid expansion of demand for energy which is significantly beyond original estimates.

¶17. (U) Thulani Gcabashe, Eskom's CEO said that Eskom was fast-tracking plans to build a combined cycle gas turbine generator in the Western Cape with a base load of between 1,800 and 2,200 MW and that the board would make an investment decision in a couple of months. Eskom also recently started building two peak-load oil-fired gas turbine generators, which would add 1,050 MW to the grid, and come on stream by April ¶2007. Similarly, the Department of Minerals and Energy has a tender out for two 500 MW Open Cycle Gas Turbine plants to be built in the region, but these will only be operational by about ¶2008.

¶18. (U) In the medium to longer term other options become available to the Western Cape, including the first unit of a pebble bed reactor (165 MW), power from the proposed natural gas-fired turbine plant in Namibia (using gas from the Kudu gasfield), and a similar 400 MW unit on the Cape west coast using natural gas from Forest Oil's Ibhubesi gas field. The possibility of building a second conventional nuclear plant on the Koeberg site was also mention by Erwin.

¶19. (U) Gcabashe and Erwin have agreed on the process for getting Unit 1 back on line. The sequence would be to: borrow a 200 ton rotor and stator bars from Electricite de France and have the parts brought by barge to South Africa, probably within a month; synchronize Unit 1 with the power grid in the middle of May; refuel and service Unit 2 starting in the third week of May - there will be a week's overlap between starting of Unit 1 and the shutdown of Unit 2; run Unit 2 at decreasing power output over the next three months until stopped for refueling and maintenance towards the end of May; supply the electricity needs of the Western Cape from Mpumalanga. During peak periods there could be a shortfall of some 300 MW, but Eskom is convinced that some 400 MW can be saved through demand-side and supply-side management innovations.

¶20. (U) COMMENT: Eskom has stated on numerous occasions that the generation side of electricity supply is well under control (if somewhat tight under peak load conditions) and that the problem lies with a poorly maintained, old and out-of-date distribution infrastructure. Most supply disruptions have resulted from equipment or line faults and are seldom due to insufficient generation capacity. In addition, a number of transmission lines need upgrading to meet the ever increasing demand for power from an expanding economy and rapidly growing population base - some 70% of South Africans now have access to electricity, up from about 35% fifteen years ago.

¶21. (U) Much of the blame rests with some 284 municipalities that buy bulk electricity from Eskom and distribute to rate-payers over their owned networks. About 50% of municipalities have neither the skills nor resources to maintain their infrastructure. To make matters worse, electricity revenues are used to cross-subsidize other services and not to maintain and renew equipment and systems. As a consequence the SAG and Eskom developed the concept of regional electricity distributors (REDs) to overcome these problems. Six REDs were to be established with pooled resources to cover the country and ensure stable, reliable and affordable electricity distribution. The first mini-RED (the Cape Town Metro Area) went into operation on July 1 last year. Unfortunately, legal and constitutional issues must be resolved before the next RED can be implemented. An announcement on how to proceed is due this month. END COMMENT.
COFFMAN